THE EFFECT OF INTERPRETIVE MUSICAL DECISIONS AND LISTENING MEDIUM ON AUDIENCE INTEREST

by

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The Effect of Interpretive Decisions and Listening Medium on Audience Interest

The purpose of this study was to examine the effect of soloist interpretive musical decisions and listening medium (live and recorded mediums) on audience interest. All participants were currently enrolled at a large Midwest research university at the undergraduate and graduate levels, including 26 collegiate music majors (ages 18-33, *median* = 24; female, *n* = 10; male, *n* = 16). Placed in either a live listening setting or a recorded (audio and visual) setting, participant manipulated PADs (Perception Analyzer Dials) to report interest while listening to a piece of music and reported their degree of positive and negative affects using the Positive and Negative Affect Scale (PANAS) (Watson, Clark, & Tellegen, 1988).

The performer, who is also the author of this study, strategically chose a Theme and Variation piece to perform musical device manipulations. In preparation, as well as the subsequent performance of a solo piece, statements and repetitions of the same melodic material were assigned to serve as control sections and manipulated sections, respectively. Musical devices of tempo, dynamics, and gestural movement were manipulated, one for each selection of music. The participants completed two questionnaires in the main study, one prior to listening to the musical performance and one after listening. Results showed a significant decrease in mean negative-affect PANAS scores following both live and recorded listening settings. Additionally, the live listening setting produced significantly higher mean interest ratings than the recorded listening setting.

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Chapter 1: Rationale

In a growing age of technology, where major works of music can be created with the push of a few buttons, the musician must always be concerned with connecting to audience members in meaningful ways. Related to this performer-audience connection are three major components of this study: musical expression (see *definition of terms*), listening medium (the context in which music is delivered to the audience), and audience members' perception of their own interest (see *definition of terms*).

Juslin's (2003) GERMS model has often served as a theoretical framework for studies of musical expression; and Eerola and Vuoskoski's (2010) two-dimensional model of music listening and expression is also cited, though not as often. Juslin's (2003) GERMS model delineates five dimensions that contribute to the expressiveness of a musical performance. The content areas are: Generative Rules, Emotional Expression, Random Variability, Motion Principles, and Stylistic Unexpectedness. Generative Rules convey the musical structure to listeners. Emotional Expression calls the performer to render a performance with a particular emotional expression. Random Variability refers to random fluctuations that are inherent in a human performance of any kind (i.e. unintentional tempi changes, mistakes). Motion Principles refers to aural features that imitate physical motions (e.g., swaying) which can be derived from intentional (i.e., *ritardando*) and unintentional performer manipulations (i.e., tempi changes that reflect the slide challenges of a trombone). Finally, Stylistic Unexpectedness refers to a violation of musical expectations, such as delaying a resolution or emphasizing tension.

This GERMS model can also serve as a basis for a soloist's interpretive musical decisions, meaning these can inform their choice of musical devices that could be manipulated and, in turn, potentially have an effect on audience members' perceived interest. The

expressiveness of musical devices has been explored through the manipulation of dynamics, tempo, and gestural movement which have been found to be correlated with listeners' perceptions of a performer's expressive intent (Schubert, 2004; Gabrielsson & Juslin, 1996).

Listening medium has been explored through multiple studies involving listeners' response to live or recorded music (Bailey, 1983; Lamont, 2011; Wheeler, 1985). Lamont (2011) found that musicians tended to have the most memorable and strongest affective musical experiences when in a live, group listening setting. Conklin (2011) found that self-reported music performance anxiety of solo pianists was much lower during, and following recorded performances than it was during live performances.

Bailey (1983) explored the effect of live and recorded music listening on cancer patients while receiving medical treatment. Amongst the 50 participants, the live music subjects reported significantly less tension/anxiety and more vigor than the recorded music subjects ($p < .05$). Additionally, subjects in the live music condition reported more positive changes in physical discomfort ($p < .05$), changes in mood ($p < .01$), and positive changes of mood ($p < .001$). Lamont (2011) examined what forms of engagement with music are most memorable and found that individuals who self-identify as musicians tend to have the most memorable and affective music experiences when in a live, group listening setting.

A great deal of literature studying audience perception of musical expression involves continuous self-reports of perceived affect, typically gathered through the use of a Continuous Response Digital Interface (CRDI) (e.g., Madsen & Frederickson, 1993; Madsen, 1997; Madsen & Geringer, 1999, 2000; Silveira & Diaz, 2014). Many studies using such devices share the same theme: audience members, regardless of skill, age, or prior knowledge, are able to perceive intentional changes in affects within music (i.e., tension, emotion, dynamics, tempo, etc.). Other

studies broaching the same subject without the use of CRDI tend to use questionnaires as measurements (Chin & Rickard, 2012; Juslin & Laukka, 2004; Lamont, 2012). Lamont (2012) studied musicians' self-reported well-being during performances, finding positive correlations between positive emotions (measured using the Strong Experiences of Music Descriptive System) and personal engagement.

Juslin & Luakka's (2002) research involved 141 students in a questionnaire study regarding participants' strongest emotional experiences with music. Results showed that there was a strong relation between emotion and primary motive for listening to music. Husain (2002) examined effects of tempo and mode on spatial ability, arousal, and mood. Nix, Watson, Pyszczynski & Greenberg (1995) studied if external focus on a task would change participants' affects in depressed and non-depressed collegiate students; results found external focus reduced anxiety, regardless of the participants' prior levels of depression. McAdams, et. al (2004) explored the influences of form and context on perception via continuous responses, finding an overall decrease in emotional impact when materials were repeated.

Problem Statement

The expressiveness of musical devices (Eerola & Vuoskoski, 2010; Juslin, 2003; Gabrielsson & Juslin, 1996; Schubert, 2004;), the impact of live versus recorded listening mediums (Bailey, 1983; Chin & Rickard, 2010; Conklin, 2011; Lamont, 2011; Wheeler, 1985), concomitant audience perception (Chin & Rickard, 2012; Juslin & Laukka, 2004; Lamont, 2012; Madsen & Geringer, 1990; Madsen & Frederickson, 1993; Madsen, 1997; Madsen & Geringer, 1999; Madsen & Geringer, 2000; Silveira & Diaz, 2014), and affective responses to music (Juslin & Laukka, 2004; Husain, et. al, 2002; McAdams, 2004; Nix, et. al, 1995) have all thoroughly been explored in prior research studies. Yet there is not a study that broaches a

combination of these topics, allowing for suggestions that can relate directly to music educators and performers, alike, by informing musicians which musical devices are most perceived by audience members. Understanding what musical decisions can impact audience interest, as well as the effect listening medium can have on audience interest is important for helping musicians refine their art and craft.

Purpose of the Study

The purpose of this study was to examine the effect of soloist interpretive musical decisions and listening medium (live and recorded mediums) on audience interest. Five key questions were explored throughout this study:

(1) Does the listening medium, live or recorded, effect audience members' perceived interest?

(2) Do changes in audience interest correspond with the intentional manipulation of musical devices by the performer?

(3) Does any change in audience interest that corresponds with the intentional manipulation of musical devices by the performer vary as a function of live or recorded listening mediums?

(4) Is there a significant difference between audience members' self-reported positive or negative affect immediately following the performance and self-reported positive or negative affect in general that day?

(5) Do any differences between audience members' self-reported positive or negative affect immediately following the performance and self-reported positive or negative affect in general that day vary as a function of live or recorded listening mediums?

Delimitations

The sample will be limited to collegiate music majors at a top-tier school of music in the American Midwest.

Definition of Terms

Affective Reactions: An individual's emotional and/or affective response to music (Chin & Rickard, 2010).

Continuous Response Digital Interface (CRDI): A device, in this case a hand-held dial, used to continuously record nonverbal, responses to a stimulus.

Communication: Accurate communication requires that there is both a performer's intention to express a specific concept and recognition of this concept by a listener (Juslin, 2003).

Expression: A set of perceptual qualities that reflect psychophysical relationships between 'objective' properties of the music, and 'subjective' impressions of the listener (Juslin, 2003).

Interpretation: The individualistic shaping of a piece according to the musical ideas of the performer (Juslin, 2003).

Interpretive musical decisions: Music devices purposefully manipulated by the performer, including changes in dynamics, tempo, and gestural motion.

Interest: An individual's perception of his/her engagement with a musical performance.

Chapter 2: Review of Related Literature

The following literature review represents a collection of research related to audience perception of interest within multiple musical contexts, as well as research exploring what interpretive decisions by a performer makes a performance impactful. As a Continuous Response Digital Interface (CRDI) is a common device for recording continuous self-report data, this literature review also encompasses its history and effectiveness. Subtopics organizing these materials include: audience perception of music performances, the qualities that make a musical performance impactful, how the listening context may affect perception of a music performance, and a brief sketch of recent research dealing with affective responses to music.

Interpretive Musical Decisions and Musical Expression

Schubert's study (2004) must be considered when exploring the manipulation of musical devices for expressive intent. Here, Schubert set out to explore the relationship between musical features and perceived emotion and arousal. Sixty-seven participants responded to four pieces of recorded Romantic music coded via musical elements: dynamics, tempo, melodic contour to express different emotions. A continuous response method (1 second per rating) was used on a two-dimensional emotion space (happy, sad valence versus aroused, sleepy).

Results showed that 33% to 73% of the variation in perceived emotion could be explained by the musical elements. Changes in loudness and tempo both had positive associations with arousal, with loudness providing the majority of varied responses. Melodic contour varied positively with valence, but not significantly. Changes in texture and timbre did not produce consistent results. The overall findings of this study suggest that the majority of arousal and emotional responses in this study can be explained with a small number of musical features (>60% variance in arousal response was explained by dynamic and tempo changes).

Additionally, Schubert suggests that memory is an important part of the listening process, making a significant contribution to perceived emotion. Once it is established that the audience perceives changes in musical devices, how can the performer create these changes? Juslin's GERMS model provides a framework for possible application.

Juslin (2003) outlines a psychological approach to expression in music performance, which may provide an educational foundation for teaching expression in music performance (p. 273). After summarizing prior research and a history of neglect regarding the study of musical expression, Juslin defines three key terms (p.276-277):

> *Interpretation:* the individualistic shaping of a piece according to the musical ideas of the performer.
>
> *Expression*: a set of perceptual qualities that reflect psychophysical relationships between 'objective' properties of the music, and 'subjective' impressions of the listener.
>
> *Communication:* accurate communication requires that there is both a performer's intention to express a specific concept and recognition of this concept by a listener.

Juslin outlines factors that may influence musical expression, including some that I find helpful for the parameters of my study: performer's expressive intention with regard to the mood of the piece, the performer's mood while playing, the performer's perception of/interaction with the audience, the listener's music expertise, the listener's current mood, the listener's state of attention, and the listening context (e.g. concert, recording). Finally, Juslin outlines his GERM model for musical expression: Generative Rules, Emotional Expression, Random Variability, Motion Principles, and Stylistic Unexpectedness. This GERMS model can serve as the basis for the soloist's interpretive musical decisions, meaning these are the musical devices that will be manipulated to determine any change (if any) in audience members' perceived interest.

Further evidence of the impact of musical devices on perceived expressiveness can be found in this combination of two studies within one publication. Gabrielsson and Juslin (1996) asked nine professional musicians to perform short melodies (monophonic) on various instruments (violin, electric guitar, flute, and voice), with the intent of communicating specific "emotional characters" (happy, sad, angry, fearful, tender, solemn, and no expression) to listeners. The first study involved 56 musicians and non-musicians (ages 24-69), whereas the second study involved 37 musicians and non-musicians (ages 19-52). All instruments played four melodies, and all but one were a recognizable folk or pop tune (i.e., *Nobody Knows, Te Deum,* and a Swedish folk melody). The third melody was composed for the study; all melodies were asked to be memorized (this happened for most performances). Listeners rated audio recordings of the performances of the melodies according to emotional expression, before the researchers analyzed the recordings for "physical characteristics" (i.e., tempo, dynamics, timing, and spectrum).

Gabrielsson and Juslin (1996) found that performer's expressive intention to have an effect on all physical characteristics of the musical performance (listed above), and listeners were able to identify this expressive intent. The performer's instrument also had an effect on the results in this particular study: the vocalist, while showing the same tendencies as the instrumentalists, was rated as far less expressive than the instrumentalists. With so few performers, this difference is certainly inconclusive, but it is important to note that the "physical characteristics" of tempo, dynamic, and timing were all determined in this study to be perceivable by listeners.

Once musical devices are defined and determined, it is important to realize how exaggerated these manipulations must be. Ideally, the performer will add to the written work of

art, not distract from it. Eerola and Vuoskoski (2010) compared perceived emotions in music using two frameworks: the discrete emotion model and the dimensional model of affect. A secondary purpose was to introduce new set of stimuli for the study of music-mediated emotions by either merging or eliminating portions of the aforementioned models. A pilot study was conducted using 110 film music excerpts – 50 of which were moderately to highly representative examples of five discrete emotions (anger, fear, sadness, happiness, and tenderness); the other 60 excerpts were moderate to high examples of the six extremes of three bipolar dimensions (valence, energy arousal and tension arousal). One hundred sixteen non-musicians rated these excerpts using the two aforementioned theoretical frameworks, in addition to rating how much they liked the excerpts and how beautiful they were (i.e., preference and beauty ratings).

Results were run through linear mapping techniques of discrete and dimensional models, and showed a high correspondence along two central dimensions, labeled as valence and arousal. The main difference between discrete and categorical models involved characterization of emotionally ambiguous examples within the discrete model. Overall, participants were able to consistently recognize target emotions in the high examples, but during moderate examples they confused at least one emotion.

The researchers suggest that these results allow the three-dimensional model of emotions (valence, energy arousal, and tension arousal) to be collapsed into a two-dimensional model when applied to music (valence and arousal). This study specifically informs the notion that the exaggeration of musical devices impacts audience interest.

Sheldon (2004) studied undergraduate and graduate students' (n = 66) ability to identify musical devices using music terminology and figurative statements upon listening to recordings. To determine what figurative statements and terminology were used in the study, music majors

at a university (music education majors), and local music educators were asked to consider terminology they would use to teach expressive performance to a musician, list the specific music nuance attempting to be achieved, and precisely how the musician would accomplish this goal. Five such examples per participant were rated by four experts in the field (*M* years of musical experience = 15.83, *SD* = 6.26), who chose 50 submissions that best captured musical expression and nuance. Ultimately, 11 figurative statements and 11 musical terms were chosen (i.e., "Like a child playing", "*Staccato* – detached and bouncy". A simple four-bar musical phrase was composed; each of 29 additional volunteers then recorded 11 versions of the piece, each version with a different figurative language.

Music education majors then listened to and rated the performances as the best fit for a figurative statement or terminology. The data indicated that listeners successfully identified general expressive categories, but these categories did not always align with what the performer intended. Generally, the majority of responses for figurative statements tended to be more in-depth than those stating specific music terminology.

Listening Medium (live vs. recorded)

Once musical selections are determined for manipulation, one may question if listening medium can affect audience interest. Bailey (1983) compared the effects of live music singing and guitar playing to the effects of tape-recorded music (of the same material) among hospitalized cancer patients. Fifty cancer patients, ranging in age from 17 to 69, were randomly selected from cancer patients at a hospital and placed into the live or recorded settings. The Profile of Mood States (POMS) questionnaire was given to each participant before and after listening to the twenty-five minutes of music.

Bailey found that subjects in the live music condition reported significantly less ($p < .05$) tension/anxiety and more vigor than those in the recording listening condition. Additionally, subjects in the live music condition reported more positive changes in physical discomfort ($p < .05$), changes in mood ($p < .01$), and positive changes of mood ($p < .001$). The results show a significant difference between perceptions of emotional states in live versus recorded settings.

Following a similar exploratory theme via qualitative methods, Lamont (2011) studied university students' self-reported strong experiences with music. Forty-six students (median age 21) gave free reports on their "most intense experiences of music listening" (p. 234). The majority of strong experiences of music (SEMs) were reported as occurring in live settings (78.3%). Of these live events, 84.6% of participants reported these SEMs occurred in group settings. Additionally, the majority of SEMs were reported to occur when listening to pop music (81.8%). Overall, these results found that most strong, positive experiences were live events in which the listener was a part of an audience, or the listener was familiar with the music. Further research is necessary to explore differences between live and recorded mediums.

While the aforementioned study shows that some individuals have strong, positive reactions to live performances, Wheeler (1985) set out to explore personality differences amongst participants who reported varying levels of music enjoyment by investigating both live and recorded mediums. The purpose of the study was to investigate influence of mood, personality characteristics, musical taste, musical training, chosen field of study (college major), gender, age, and medium of listening (live or recorded) on 101 undergraduate students' enjoyment of music by the means of a self-report questionnaire. The Personality Research Form (PRF) was given to students during a class period and listening occurred during the following class period. For the listening period, classes were assigned to live or recorded conditions based

upon their schedules. A piano player at the university performed Chopin's *Barcarolle* in each of the live settings and the recorded setting.

Results indicated little change in self-reported mood from before and after listening. Factors that were found to be significant in this small change were gender (female), self-reported enjoyment of music, PRF results, and understanding of music. The author does note that none of the live performances were the same, and were not at the same high quality as the recorded performance. This study highlights the importance of control for consistency between live and recorded settings, which needs to be considered carefully in future research.

Another issue with live performances involves the performer, specifically levels of anxiety or nervousness, and how they can affect communication and accuracy of musical interpretations. The purpose of Conklin's study (2011) was to compare the level and experience of Musical Performance Anxiety (MPA) in university piano students performing in live and virtual contexts (i.e. recorded performance contexts), in addition to investigating exposure therapy in the recording process and possible transferal of benefits to live performance settings. Eleven participants performed in three contexts: dress rehearsal without an audience, live performance in front of an audience, and a virtual performance that was recorded and distributed afterwards via a podcast. Following each performance, the Conklin Performance Anxiety Inventory was given to measure levels of MPA, and each performer was interviewed extensively to compare levels of MPA with the different performance settings. The participants then completed the following tasks; they recorded five additional virtual performances with a focus on exposure therapy, they performed a second live performance, they participated in an interview, and they had a group discussion.

Results suggested that the virtual performances elicited significantly lower levels of MPA than live settings. The exposure therapy showed moderate levels of success in lowering MPA for the second live performance, with subjects reporting more confidence in their levels of preparation. Interestingly, the results showed that the virtual performance setting elicited significantly lower levels of MPA than the live performance context (almost no physiological symptoms, and few mental symptoms). The exposure therapy resulted in only little success in participants' reduction of MPA, simply by participants gaining confidence (this was found qualitatively). Of interest to future research is how perceived performance anxiety of the performer can affect audience interest.

Providing definitions and qualitative background for items to be assessed by listeners in an audience, Chin and Rickard (2010) examined if forms of engagement with music, other than formal music training, can predict verbal memory performance. Factors controlled in this study include: gender, SES, music performance variables, and IQ. One hundred participants (66 females, 34 males) ranging from those who self-identified as musically naïve to professional musicians, were given questionnaires regarding demographics and inquiring as to their level of musicianship (Brief Music Experience Questionnaire). Participants also reported their nonperformance music engagement according to daily duration, weekly duration, and weekly frequency. These self-reported music experience items included six subscales, as defined below (p. 200):

> *Innovative Musical Aptitude*: self-reported measure of music performance ability and the individual's ability to generate or create music themes; *commitment to music*: relates to the pursuit of music experiences in the individual's life; *social uplift*: experience of being stirred and uplifted in a group setting by music; *affective reactions*: an individual's

affective and spiritual reactions to music; *positive psychotropic effects*: an individual's state of mental reactions; *reactive musical behavior*: an individual's physical reactions to music.

The California Verbal Learning Test (CLVT-II) was used to provide an assessment of verbal learning and memory (immediate recall, short/long-term free and cued recall, verbal learning, effect of interference, semantic organizational learning strategies). The results supported earlier findings that performance musicianship significantly predicted long-term free recall, short-term free recall, and cued recall. Additionally, nonperformance music activities were found to have a similarly strong association with verbal memory performance. This finding of performance recall in musicians may hold true for musicians in this study, so they may accurately recall moments in the performance and their ratings of interest. As Schubert (2004) stated, musical memory during the listening process contributes to audience perception.

Audience Engagement and Interest

In addition to research on the manipulation of musical devices and the listening medium, there have also been explorations into how audiences engage with performances. In one of the first studies to use CRDI responses, Madsen and Fredrickson (1993) measured participants' perception of musical tension to assess if the CRDI instrumentation affects this perception. As this is one of one the first studies involving tension and the CRDI (although it was informed by Nielsen's study of musical tension using tongs), the authors created a pilot study and found an overlay for the CRDI that visualized a spectrum from less (clear, narrow field) to more tension (dense, wide field). This overlay is still used in many studies involving CRDI, including Silveira and Diaz's aforementioned experiment. Madsen and Frederickson state that the use of this overlay and CRDI offer listeners who are unable to form high-level abstractions of music and

opportunity to report their perceptions, as it does not require verbalization and allows for a continuous registration of responses while listening.

An excerpt from the first movement of Haydn's *Symphony #104*, recorded by the New Philharmonia Orchestra, conducted by Otto Klemperer was obtained (the same recording used by Nielsen). The listening equipment and decibel level was the same for each listener. Forty musicians (students and faculty at The Florida State University) and 32 non-musician students at the same university were tested at individual stations in a laboratory. The participants were asked to use the CRDI to gauge their level of perceived musical tension throughout the excerpt. Results of this study closely followed Nielsen's findings (using graphical macro data): tension strongly corresponded to increases in dynamic levels, melodic movement, tonality, and density of instrumentation. While musicians' and non-musicians' responses were correlated, non-musician generally reported higher levels of tension. The authors suggest that knowing the reaction and perception of tension in music could have useful implications for therapeutic processes, thus outlining a further connection between performances and listeners.

Of concern to studies involving various levels of musical training among participants is instruction regarding focus of attention. Geringer and Madsen (2000) propose a model for educators to enhance listening experiences amongst their students, suggesting that listeners must by meaningfully engaged in the work to experience an aesthetic, or emotional response. *Figure 1* is a rough translation of the one found on page 105 of their article:

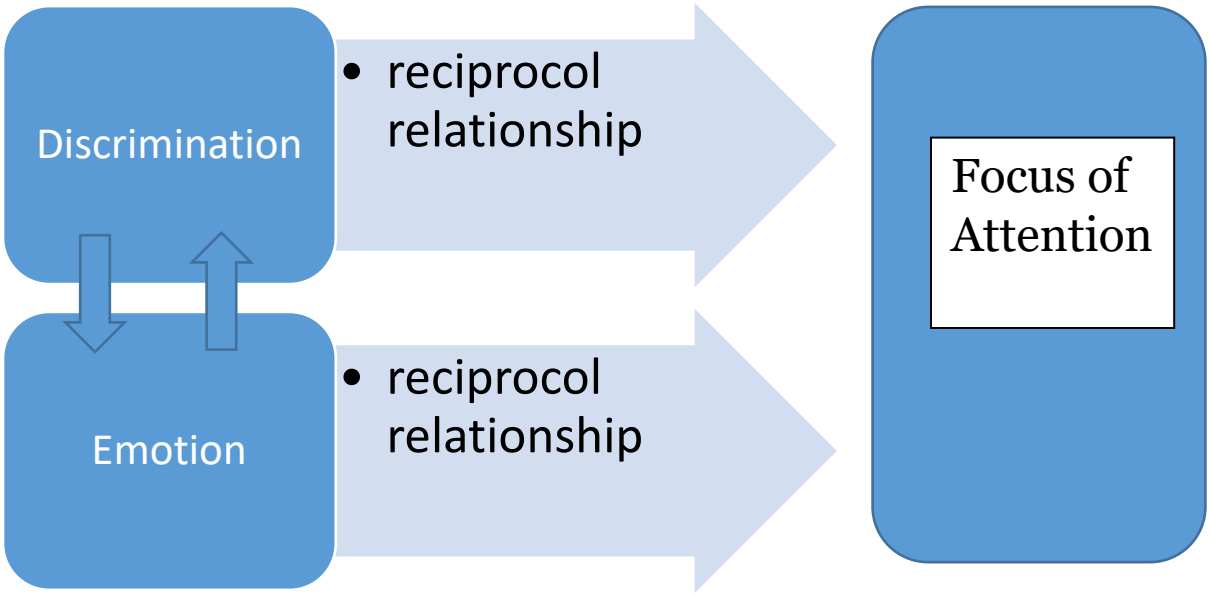


Figure 1: Geringer & Madison's (2000) focus of attention model.

In this model, the authors suggest that discrimination of musical elements (tempo, pitch, timbre, form, etc.) and emotion both directly affect and are affected by the listener's focus of attention. This model was designed with the usage of CRDI measurements in mind, allowing for potential instruction of audience listening skills.

In their study, Silveira and Diaz (2014) directed audience attention through manipulations of subtitles. The researchers investigated the effect of subtitles during a performance of an opera on listeners' perceptions of expressivity. The authors propose four research questions, involving perceived expressivity, listening condition, and focus of attention. One hundred three participants were randomly assigned to experimental and control groups and asked to listen to an excerpt (13 minutes) from a live recording of the Metropolitan Opera's production of *La Boheme* by Puccini. The participants were instructed to use the CRDI to report their perception of expressivity during the performance (on a scale of less to more; "expressivity" was intentionally not defined for the listeners). Following the listening portion of the study, participants were given a questionnaire that asked "whether they perceived expressivity while listening to the

performance, their level of focus of attention, how long the expressivity lasted, and the magnitude of the musical experience" (p 239).

Silveira and Diaz found that listeners in the audio condition had the highest response magnitude, whereas listeners in the subtitles group had the lowest response magnitude; no summative differences amongst focus of attention or perceptions of expressivity were found. In other words, the musicians who listened to just the audio reported higher levels of expressivity of performance than the groups with visual stimuli. Silveira and Diaz suggest that future research be geared towards the relationship among subtitles, expressivity, focus of attention, and comprehension.

Lamont (2012) set out to explore the music performer's attainment of wellbeing through positive psychology, explained through hedonic and eudemonic methods appealing to pleasure, engagement and meaning. Thirty-five university students self-reported their most intense experiences of performing music in a survey; these reports were then analyzed using the Strong Experiences of Music Descriptive System, with special attention paid towards student wellbeing. Thirty-five participants chose to freely respond about performances they had given; the majority reported some positive emotions in their experiences (88.6%), while a high number of people reported negative emotions (62.9%). As evident from the percentages, there were numerous participants who reported both positive and negative experiences in the same performance.

Results showed that changes from negative to positive emotions during the same performance were elicited by responses from the audience, release of performance anxiety, and interactions with other performers, respectively. Self-reported experiences by the performer can be helpful in determining connectivity to audience members' self-reported experiences, and begs

further research to include the emotional state of both the performer(s) and the audience member(s).

Madsen (1997) set out to determine if a two-dimensional CRDI (Continuous Response Digital Interface) would illicit different affective results than were previously found with the typical three-dimensional CRDI. A 20 minute recorded excerpt from Puccini's *La Boheme* was played for 48 subjects to assess their perception of arousal and its relation to affect, specifically relaxing vs. exciting and ugly vs. beautiful.

Visual and temporal analyses of the results showed no substantial difference between this and previous studies. However, this study shows that arousal responses do correlate with affective responses (r = .39) in a way that suggests a listener may need to experience some level of arousal in order to have an affective response. While this study has set a precedence for perception of interest (similarly defined here as arousal), future research is needed regarding affective interests. Before affect or emotional response is determined, it is vital to determine optimal engagement of an audience; in other words, how musicians can pique audience interest to impact audiences' emotions.

Madsen and Geringer (1990) examine if listeners demonstrate consistent focused listening patterns to different musical elements (rhythm, timbre, melody, and dynamics), and whether or not these results would differ for musicians and non-musicians. One hundred twenty collegiate participants (60 musicians, 60 non-musicians) listened to 10 orchestral excerpts and manipulated a CRDI to indicate their focus of attention on different musical elements. Results found that the group of musicians focused mostly on melody, followed by rhythm, dynamics, and timbre, respectively. Whereas non-musicians spent most their time focusing on dynamics, then melody, timbre, and the classification of *everything*, respectively.

As the final study within a series of replication studies, Madsen and Geringer (1999) asked 80 collegiate music majors to rate performances as good or bad on a Likert-type scale, specifically focusing on tone quality and intonation. Musical examples were performed from the first and second phrases of Schubert's and Gounod's *Ave Maria*, as performed by a soprano, tenor, violinist, and cellist (with and without piano accompaniment). The musical examples were purposefully adjusted such that some performances had good tone/intonation and others had poor tone/intonation. Results showed that the subjects discriminated between good and bad examples, when specifically focusing of both tone quality and intonation. These findings were similar to those of prior research, and suggest that future research is needed in regards to expanding instrument type to wind and percussion instruments, ensemble settings, and non-musicians.

Juslin and Laukka (2004) provide a brief literature review of research and theory regarding expression, perception, and induction of emotion in music. Useful to the understanding of affective responses in music are the six components of emotional response they discuss:

- Cognitive appraisal (e.g., you appraise the situation as "dangerous")
- Subjective feeling (e.g., you feel afraid)
- Physiological arousal (e.g., your heart starts pounding)
- Emotional expression (e.g., you scream and call out for help)
- Action tendency (e.g., you are strongly inclined to run away)
- Emotion regulation (e.g., you try to calm yourself) (p. 218)

Juslin and Laukka provided a critique of the extant literature in their review, highlighting the neglect of social context of music listening. Therefore the purpose of their study was to

provide an understanding of emotional responses to music within the context of everyday listening by non-musicians and musicians. An exploratory questionnaire (38 items: forced-choice, quantitative ratings, and open-ended responses included) was given to 141 music listeners between the ages of 17-74 years of age. Questions included the following topics: Musical communication; Emotion perception; Emotion induction; Relationship between perception and induction; and Basic motives for listening to music.

The researchers found a response of multiple emotions while listening to music, as well as how the participants reported the use of music throughout various life moments in life (i.e., listening to a favorite tune to relieve stress). These results confirmed the authors' hypothesis that there is a strong relation between emotion and primary motive for listening to music. As Juslin and Laukka have established that listeners' report emotional responses to music, further research needs include how musical devices engage listeners' attention.

Chin and Rickard (2012) explored the creation of a questionnaire in which participants' self-reported perceived quality and quantity of music use in various forms. The questionnaire included 8 questions regarding participants' music background and 124 items testing music engagement. Validity of the questionnaire was determined by comparing relationships between music background indices, music engagement styles, demographics, Werner's Music Experience Questionnaire (Werner, Swope, & Heide, 2006) and Gross and John's Emotion Regulation Questionnaire (Gross & John, 2003). Two hundred twenty-four participants with a mean age of 37.5 years (SD = 11.31) were studied.

Engagement analysis with an initial sample generated four engagement styles, all of which are pertinent to my study: Cognitive and Emotional Regulation, Engaged Production, Social Connection, and Dance/Physical Exercise. Analysis of a second, independent sample

supported these findings. Taken alongside the background questions, the MUSE questionnaire can be administered in two formats of varying length: 58 or 32 items. The MUSE questionnaire offers an approach to exploring the benefits of music engagement that is beneficial to future researchers who are creating pre and post-questionnaires.

Affective Responses to Music

Juslin & Laukka's (2002) research involved 141 students (aged 17-74) in a questionnaire study regarding participants' strongest emotional experiences with music. Participants were asked to state frequency of affective occurrence and freely respond to what music they listened to, how they listened to it, and what emotions they experienced during listening. Results showed that listeners are often affected by music, and that there was a strong relation in this study between emotion and primary motive for listening to music.

Husain (2002) examined effects of tempo and mode on spatial ability, arousal, and mood. Thirty-six undergraduate students in a Psychology course (M = 2.69 years of formal music lessons, SD = 3.28 years) listened to a single version of a recording of a Mozart piano sonata, then were tested on spatial abilities and perceived enjoyment; pre- and post-test questionnaires were also completed. In a second group, each version's tempo or mode was manipulated (i.e., fast/major, fast/minor, slow/major, slow/minor). Results found that tempo affected arousal but not mood; the opposite was true for mode. Faster tempi tended to increase arousal, slow tempi decreased arousal. Whereas the major mode resulted in positive changes in mood, and the minor mode resulted in negative changes in mood. Additionally, enjoyment results tended to be interactive, with higher enjoyment reported while the music was major and fast, and when minor and slow.

McAdams, et. al (2004) explored the influences of form and context on recognition processes and emotional reactions during listening, via continuous responses during concerts of a world premiere piece (solo piano, chamber orchestra, and computer generated sounds). Rating scales included familiarity or resemblance of musical materials in the piece and perceived emotional force. Two versions of the study were conducted, one in Paris (350 participants) and the other in California (550 participants). Results found participants recognized music resembling material heard previously in the piece, oftentimes corresponding with sectional structure of the work. Additionally, a close resemblance of emotional force responses across the two performances was found; emotional force were impacted by computer-processed sounds written into the work. Emotional force tended to decrease upon repetition of musical materials.

Summary

In summation, the literature review presented here is divided into four sections, based on providing a holistic approach to audience engagement.

Affective responses to music are explored by Juslin and Laukka (2002), who involved 141 students in a questionnaire study regarding participants' strongest emotional experiences with music. Husain (2002) examined effects of tempo and mode on spatial ability, arousal, and mood. Nix, et. al (1995) studied if external focus on a task would change participants' affects in depressed and non-depressed collegiate students; results found external focus reduced anxiety, regardless of the participants' prior levels of depression. McAdams, et. al (2004) explored the influences of form and context on perception via continuous responses. Interestingly, results found a decrease in emotional impact when materials were repeated.

Interpretive musical decisions are identified in Juslin's GERMS model (2003). Schubert's research (2004) explores similar musical features to the GERMS model, and audience

members' perceived arousal. And Gabrielsson and Juslin (1996) studied similar topics as Schubert, specifically focusing on audio recorded performances.

Live and recorded listening mediums are explored by Bailey (1983) in a quantitative study detailing the effect of live and recorded music on hospitalized cancer patients. Whereas Lamont (2011) surveyed university students' experiences listening to music that left a profound impact on them.

Finally, audience perception was explored by Madsen and Frederickson (1993) through audience members focus on perception of musical tension. Madsen and Geringer (2000) proposed a focus of attention model to instruct audience members' listening. Silveira and Diaz (2014) found listeners' perception of expressivity to be much more sensitive when audience members focused on audio alone, rather than subtitles or visual components of an operatic performance.

As clearly evident by these findings, a large gap of research exists in the exploration of perception through listening mediums. The research reviewed found consistent musical devices (including changes in rhythm, dynamics, gesture, and timbre) to effect audience perception of engagement.

Chapter 3: Methodology

The purpose of this study was to examine the effect of soloist interpretive musical decisions and listening medium (live and recorded) on audience interest. The first two chapters have established a rationale for the study and summarized research related to audience perception of music performances, the qualities that make a music performance expressive, and how the listening context may affect perception of a music performance. Through examining how musical devices and listening medium effect audience interest, performers may be better able to engage audiences and educators may be able to provide more appropriate instruction to their student musicians.

Participants

Participants included 26 collegiate music majors (ages 18-33, *median* = 24; female, *n* = 10; male, *n* = 16). All participants were currently enrolled at a large Midwest research university at the undergraduate and graduate levels. Primary instruments of participants included cello, bass, voice, guitar, flute, clarinet, bassoon, saxophone, trumpet, horn, trombone, euphonium, and tuba. The participants in the live and recorded groups were compared on gender, age, graduate/undergraduate student, and familiarity with the performer (undergraduate students, *n* = 10; graduate students, *n* = 16; familiar w/soloist, *n* = 16, unfamiliar w/soloist, *n* = 10). There were no statistically significant differences for any of the above characteristics as a function of live or recorded conditions.

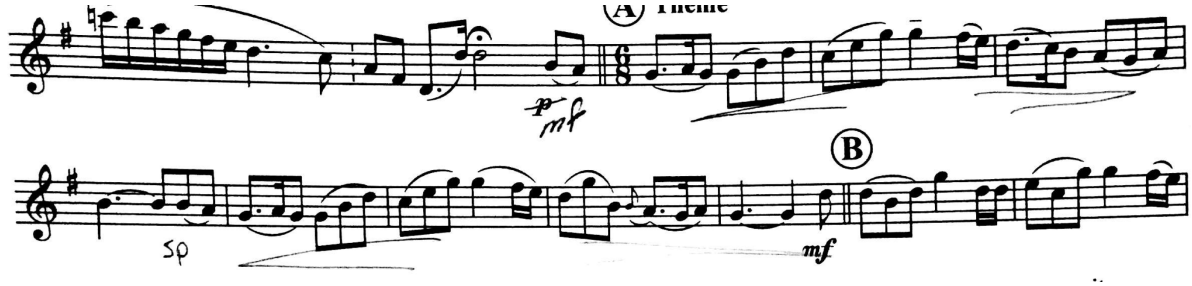
Volunteer participants were recruited using email communication and flyers posted in each of the music buildings at the university. Participants were asked to commit to one of two study dates they could attend: Monday, March 27th at 8:20pm (Group 1) and Friday, March 31st

at 12pm (Group 2). Participants in each group were randomly assigned ID numbers that also indicated which Perception Analyzer Dial (PAD, see below) they used to participate in the study.

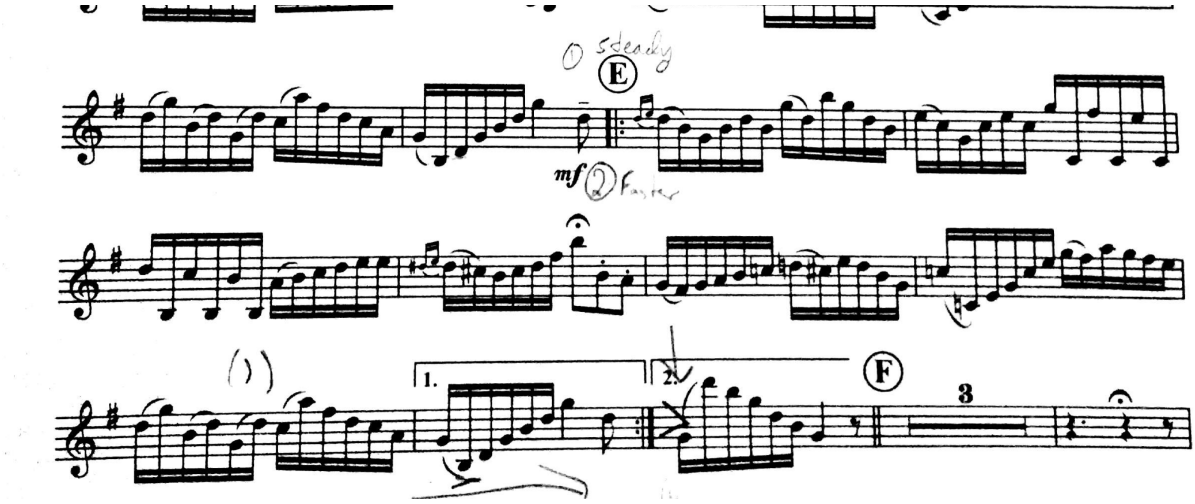
Musical Stimuli

The performer, who is also the author of this study, strategically chose a Theme and Variation piece to perform, as this allowed for repeated material to be manipulated on the second repetition. The goal was to make, practice, and perform nuanced decisions that can be realistically applied in any music performance.

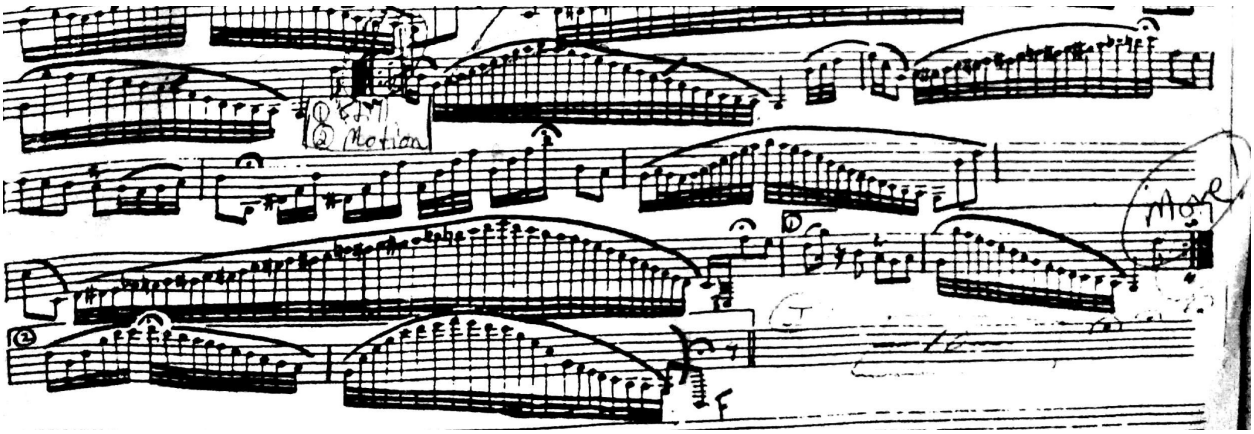
Believe Me, If All Those Endearing Young Charms by Simone Mantia (1873-1951) was chosen as the musical selection for this study due to its Theme and Variation style, which includes repeated material. In preparing *Believe Me, If All Those Endearing Young Charms,* portions of music were assigned to serve as control sections, followed immediately by the repeated material, which were chosen as the manipulated sections. In the repetition of the statement of the Theme, the dynamics were manipulated. In Variation I, the tempo was manipulated. And in Variation II, gestural movement was manipulated. In all cases, the manipulation involved the performer adding more variety of each musical characteristics in the second repetition of the musical material. Musical examples of the manipulations are provided in Examples 1-3



Example 1. Theme. Control section – *mezzo forte*. Manipulation section – *subito piano*.



Example 2. Variation I: Control, steady tempo (60 bpm). Manipulation, faster tempo (70 bpm).



Example 3. Variation II. Control, no gestures. Manipulation, physical gestures.

Measures

Measures used in this study included Perception Analyzer Dials (PADs), a type of Continuous Response Di

gital Interface (CRDI). CRDI are common devices in affective research in music that record continuous, moment-to-moment measurements without requiring a verbal response. Numeric values on the PADs were anchored with specific levels of affect: 0 (*no interest)*, 50 (*moderate interest*), and 100 (*total interest*). The Perception Analyzer Dials are synced to proprietary

software (DialSmith Perception Analyzer, beta 9.0, 2017) that collect measurements from each dial once-per-second. The software was then used to export the data in a comma-separated-value spreadsheet. The data collection process was piloted with 12 participants. At the completion of the pilot, the participants were asked to report on a Likert-type scale if the PAD was distracting from the performance. It was determined the dials were not significantly distracting to the audience members.

The participants completed two questionnaires in the main study, one prior to listening to the musical performance and one after listening. As detailed in the participants section, the first questionnaire included items pertaining to participants' age, gender, degree program, primary instrument, and whether they were familiar with the euphonium soloist they were about to hear play. In addition, both questionnaires directed participants to complete the Positive and Negative Affect (PANAS) scale (Watson, Clark, & Tellegen, 1988) (see *Figure 2*). A widely-used scale measuring mood or emotion, the PANAS is comprised of 20 items: 10 positive affect items (e.g. interested, inspired) and 10 negative affect items (e.g. upset, hostile). Each of these items is rated on a Likert-type scale, as seen below in Figure 1. In the current study, Cronbach's alpha tests were conducted to determine internal consistency of the PANAS questionnaire; the results showed high reliability: pre- and post-test positivity: .89 and .82, respectively, and pre- and post-test negative: .89 and .79, respectively.

In the first questionnaire (i.e., pre-listening), the participants were instructed to respond to the PANAS according to their general affective state throughout their day so far. In the second questionnaire (i.e., post-listening), the participants were instructed to respond to the PANAS according to their specific affective state in that very moment. At the completion of the study, the participants were asked to report on a Likert-type scale if the PAD was distracting from the

performance. Like the pilot test, it was determined the dials were not significantly distracting to the audience members.

1 *Very slightly or not at all*	*2* *A little*	*3* *Moderately*	*4* *Quite a bit*	*5* *Extremely*

_____	Interested	_____	Irritable
_____	Distressed	_____	Alert
_____	Excited	_____	Ashamed
_____	Upset	_____	Inspired
_____	Strong	_____	Nervous
_____	Guilty	_____	Determined
_____	Scared	_____	Attentive
_____	Hostile	_____	Jittery
_____	Enthusiastic	_____	Active
_____	Proud	_____	Afraid

Figure 2. PANAS measure (Watson, Clark, & Tellegen, 1988)

Procedure

In February of 2017, an application submitted to, and approved by, the IRB. The volunteer participants were asked to listen to the same music performance in one of two conditions: (Live) as a live performance or (recorded) as a video-recorded performance. Live participants were all seated in the balcony of a University Recital Hall, separate from the other live audience members seated below. The live performance took place within the context of a

Music Education Student Recital, with short 4-6 minute performances surrounding the performance of *Believe Me, If All Those Endearing Young Charms*. The visual component of the live performance was recorded from the perspective of the participants in the balcony, while the audio component of the live performance was recorded from microphones in front of the stage. This recording was used as the stimulus with the recorded group.

Recorded group participants were seated together in a large, single level rehearsal room in the University's school of music that allowed the visual aspect of the recorded performance to be projected onto a single screen while high quality speakers played the audio of the recorded performance. No edits were made to the recorded performance; as a result, the recorded group participants watched and heard the same exact performance as live group participants.

As to not disturb the performances prior to and following the study's performances, participants were handed the following instructions upon arrival and asked to read them before entering the performance location. Besides responding to a few questions, in both the live and recorded sessions, no verbal instructions were given. Participants were given the following instructions:

> Thank you for your participation in this study. Please complete *Questionnaire One* now. Then, turn your dial to 0 (*no interest*). Now turn your dial to 50 (*moderately interested*). Finally, turn your dial to 100 (*total interest*). Get a feel for how the dial turns, then set the dial to 50 (*moderately interested*). You will be using this dial as a continuous response, detailing your interest (i.e. engagement with the music) from moment-to-moment during performances of:
>
> *Three Preludes* – George Gershwin, arr. Giselle Goad
> Becca Kronyak, alto saxophone
> Nate Heed, trombone/euphonium
> Giselle Goad, piano
>
> [Reset dial to 50]
>
> *Believe Me, If All Those Endearing Young Charms* – Simone Mantia
> Briana Engelbert, euphonium

Piotr Wisniewski, piano

You may move the dial as smoothly or quickly, and however often as you'd like. Be sure to reset your dial to 50 before each performance.

Immediately following the euphonium performance, please complete *Questionnaire 2.* If you have any questions, you may ask them now.

Chapter 4: Results

(1) Does the listening medium, live or recorded, effect audience members' perceived interest?

Figure 2 depicts participants' mean aggregate responses of self-reported interest ratings throughout the euphonium performance in live (solid red line) and recorded (solid blue line) listening conditions. Standard error (SE) is reported on this graph as the corresponding dotted lines above and below the listening conditions. The x-axis represents time, in seconds; whereas the y-axis represents interest ratings. Audience members were asked to report their interest throughout the performance as often or as little as they liked. The dial included the numbers 0-100, with 0 being *no interest*, 50 being *moderate interest*, and 100 registering *total interest*. All dials were re-set to 50 before the euphonium performances (after the trial trio performance). In reviewing the questionnaire each participant completed, the majority of responses reported little distraction from usage of the PAD; and an independent groups *t*-test indicated there were no significant differences in reports of the PAD being distracting between live and recorded groups ($p > .05$).

Upon visual inspection, the overall graph of aggregate responses shows peaks and valleys in both listening conditions that are not notated as *control* or *change*. The peaks typically correspond with euphonium entrances after piano interludes, stating a new variation on the theme, and the valleys correspond with the euphonium resting during piano interludes, where the original theme is usually stated with slight variation (see attached score/recording). The results show a tendency for the live audience to report higher interest ratings than the recording audience; any differences in this trend are small, and not statistically significant ($p > .05$). Any

trends in standard error may indicate agreement in judgements of interest (e.g., SE grouped closer together), or more disagreement in judgements of interest (e.g., SE grouped further apart).

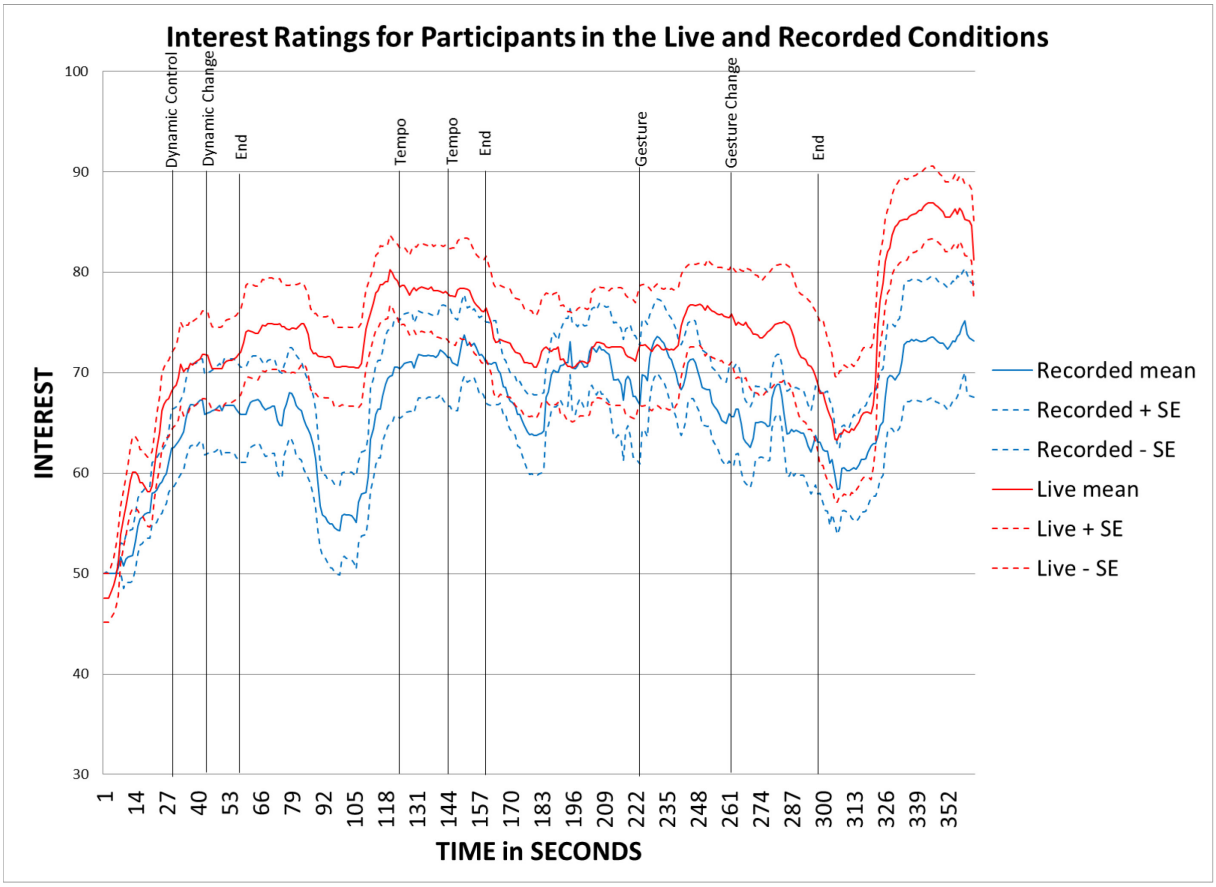


Figure 3. Mean ratings for live and recorded group participants across the entire piece.

(2) Do changes in audience interest correspond with the intentional manipulation of musical devices by the performer? (3) Does any change in audience interest that corresponds with the intentional manipulation of musical devices by the performer vary as a function of live or recorded listening mediums?

A 2 x 40 x 2 mixed design ANOVA with manipulation of gesture and time as repeated measures factors, and whether listeners participated in the live/recorded listening medium as a between-subjects factor, was conducted to examine differences as a function of manipulation of

the musical elements. The time factor was included in the ANOVA to compensate for autocorrelation among interest ratings. Mean interest ratings according to experimental group (live vs. recorded) and manipulation of gesture (control vs. experiment) over time is depicted in Figure 3. Greenhouse-Geisser critical values were examined to determine significant effects. There were no significant main effects were found for manipulation of musical devices, within live or recorded listening mediums, or time ($p < .05$).

Overall, a significant main effect was found, according to manipulation of musical devices ($p = .04$). The control condition's (*no motion*) interest was rated significantly higher than the experimental condition (*motion*). The difference represents a moderately strong effect with an *Eta Squared* value of .16. Significant main effect was found for time ($p = .03$); this indicates that the interest ratings varied significantly throughout the 40 second interval. However, no significant interactions were found.

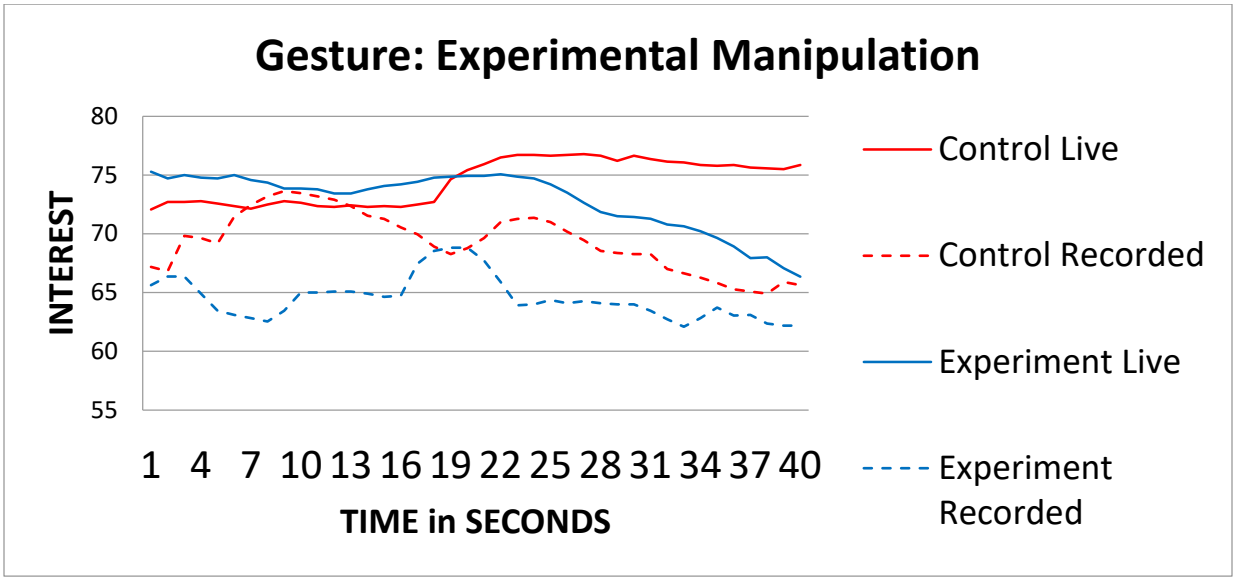


Figure 4. Plot of mean interest ratings for the gestural musical element manipulation.

Additionally, the 2 x 19 x 2 mixed design ANOVA with manipulation of tempo and time as repeated measures factors, and whether listeners participated in the live/recorded listening

medium as between-subjects factor, respectively was run. The time factor was included in the ANOVA to compensate for autocorrelation among interest ratings. Greenhouse-Geisser critical values were examined to determine significant effects. There were no significant main effects were found for manipulation of musical devices, within live or recorded listening mediums, or time ($p > .05$). Mean interest ratings according to experimental group (live vs. recorded) and manipulation of tempo (control vs. experiment) over time is depicted in Figure 4. There were no significant main or interaction effects found for manipulation of tempo, within live or recorded listening mediums, or time ($p > .05$).

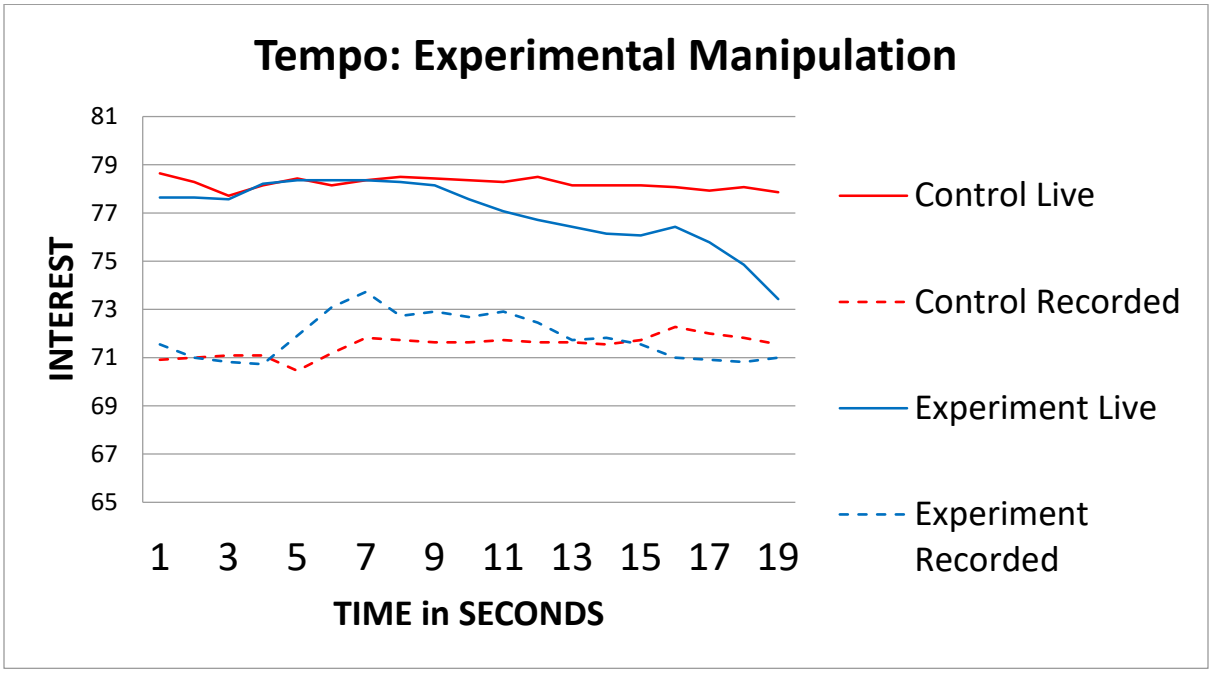


Figure 5. Plot of mean interest ratings for the tempo musical element manipulation.

Finally a 2 x 14 x 2 mixed design ANOVA was studied, with manipulation of dynamics and time as repeated measures factors, and whether listeners participated in the live/recorded listening medium as between-subjects factor, respectively. The time factor was included in the ANOVA to compensate for autocorrelation among interest ratings. Greenhouse-Geisser critical

values were examined to determine significant effects. Mean interest ratings according to experimental group (live vs. recorded) and manipulation of dynamics (control vs. experiment) over time is depicted in Figure 5. There were no significant main or interaction effects found for manipulation of dynamics, within live or recorded listening mediums, or time ($p > .05$).

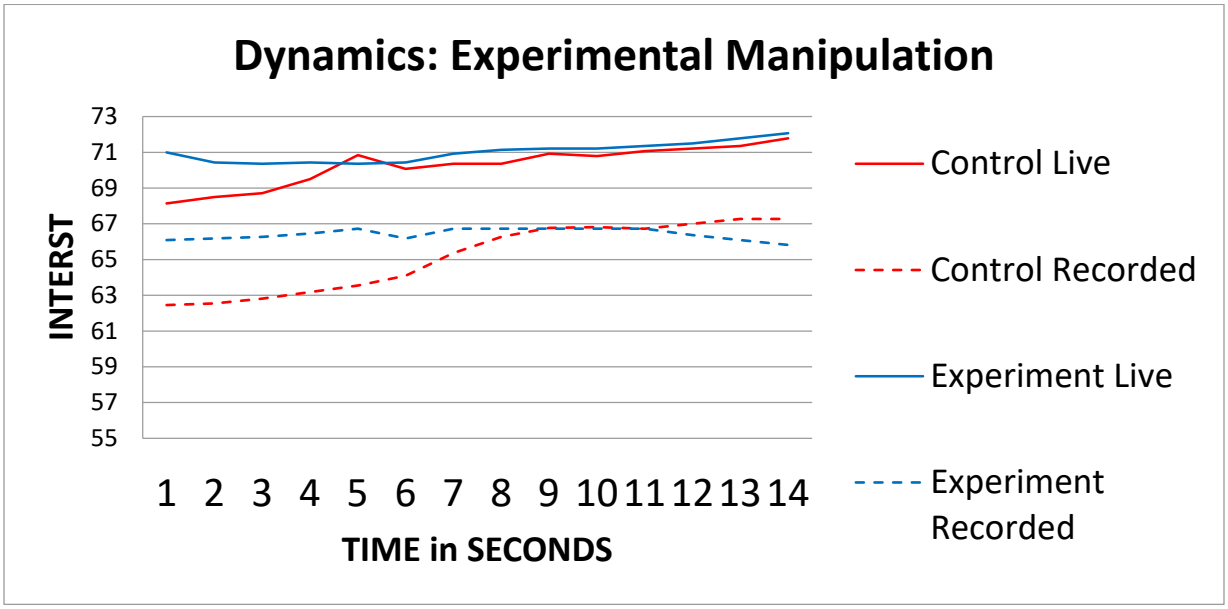


Figure 6. Plot of mean interest ratings for the dynamics musical element manipulation.

(4) Is there a significant difference between audience members' self-reported positive or negative affect immediately following the performance and self-reported positive or negative affect in general that day?

The participants in the live and recorded groups were examined for gender, age, graduate/undergraduate student, and familiarity with the performer. Chi square analyses and independent groups *t*-tests indicated there were no statistically significant differences ($p > .05$) for any of the above characteristics between the live and recorded conditions.

The PANAS questionnaire was found to be reliable: pre-test positivity (.89), post (.82), pre-test negative (.89), post (.79). Descriptive statistics for PANAS results can be found in Table 1.

Additionally, paired samples *t-tests* were run to examine differences in pre-to-post positive and negative affect scores. Post-test negative affect scores were found to be significantly lower than pre-test negative affect scores $t(21) = 4.64$, $p<.001$. No significant difference was found for differences in the positive affect measures.

Table 1

PANAS Questionnaire Results

	Pre-test		*Post-test*	
	M	*SD*	*M*	*SD*
Positive				
Live	34.18	8.94	31.00	8.17
Recorded	30.54	7.18	29.27	8.59
Negative				
Live	17.72	6.26	11.81	1.77
Recorded	17.00	5.40	12.00	3.60

(5) Do any differences between audience members' self-reported positive or negative affect immediately following the performance and self-reported positive or negative affect in general that day vary as a function of live or recorded listening mediums?

In exploring statistical significance of this question, a 2 x 2 mixed design ANOVA with pre- and post-test positive affect scores as a repeated measures factors, and whether listeners participated in the live/recorded listening medium as between-subjects factor was conducted. No

significant main effects or interaction effects were found in pre- and post-test positive affect scores, within live or recorded listening mediums, or time ($p > .05$).

A 2 x 2 mixed design ANOVA with pre- and post-test negative affect scores as a repeated measures factors, and whether listeners participated in the live/recorded listening medium as between-subjects factor, was run. Results were consistent with the previous t-test scores listed in that there was a significant decrease in negative affect over time, but no interaction with listening condition.

Chapter 5: Discussion

(1) Does the listening medium, live or recorded, effect audience members' perceived interest?

This study shows a tendency for the live audience to report higher interest ratings than the recording audience. As stated above, any differences in this trend are small, and not statistically significant. Anecdotal evidence of this live/recorded listening experience from musicians supports this finding and Lamont (2011) also found that live, group listening settings were the strongest affective musical experiences, with the most memorable outcomes. Additionally, Bailey (1983) found that, amongst cancer patients receiving medical treatment, participants listening to live music reported more positive changes (i.e. more vigor, physical comfort, less changes in positive mood changes, and significantly less tension/anxiety) than participants listening to recorded music.

(2) Do changes in audience interest correspond with the intentional manipulation of musical devices by the performer? (3) Does any change in audience interest that corresponds with the intentional manipulation of musical devices by the performer vary as a function of live or recorded listening mediums?

Overall, one significant main effect was found regarding the manipulation of musical devices. *Physical gesture* control, followed by manipulation resulted in the control rated significantly higher than the manipulation. Admittedly, this does not match the hypothesis that manipulation of a musical device would increase audience interest. However, it is important to remember that while there is a correlation between musical device manipulations and lower interest rates, this does not prove causation. It is quite possible that a performance of the same material without changes in musical devices would result in an even lower interest rate than

reported in this study; if this occurs, it would suggest the repetition of melodic content, rather than a change in musical devices, lowers interest. Of course, this is a topic for future research. There were no significant main or interaction effects found for manipulation of dynamics, tempo, or physical gesture within live or recorded listening mediums.

(4) Is there a significant difference between audience members' self-reported positive or negative affect immediately following the performance and self-reported positive or negative affect in general that day? (5) Do any differences between audience members' self-reported positive or negative affect immediately following the performance and self-reported positive or negative affect in general that day vary as a function of live or recorded listening mediums?

In both live and recorded sessions, pre-to-post positive and negative affect scores were tested through the PANAS questionnaire. While no significant change was found for differences in the positive affect measures, post-test negative affect scores were found to be significantly lower than pre-test negative affect scores; there was no interaction with listening conditions, meaning that similar results were found (post-test negative affect scores were lower than pre-test scores) in live and recorded sessions.

The finding that negative affect scores were lower after listening to a performance is not surprising to those familiar with music. Supporting this claim are Nix, et. al's (1995) finding that an external focus task tended to lower anxiety, regardless of prior state of mind, and Husain (2002) whose findings suggest that manipulation of tempo affects arousal, or interest. Further supports of this claim involve Juslin and Laukka (2004) finding that a strong relation between emotion and primary motive for listening to music throughout musicians and non-musicians, and Bailey (1983), who found negative affects of participants in the live music sessions to

significantly decrease more than the recorded music sessions. In other words, negative affect scores may be lower not because of particular musical manipulations, but from the act of an external focusing task (i.e., purposefully listening to music).

Limitations

When discussing the results of this study, a discussion of the sample size is of upmost importance: the sample included all collegiate musicians who freely chose to participate in this study, towards the end of Spring semester. A sample size selecting non-musicians is likely to produce different results, as there may be less familiarity with musical terms and less experience in purposefully engaging with music.

As the performer and author of this study, I found myself focusing solely on manipulating the musical stimuli during the performance, rather than focusing on creating a story for the audience or singing through my instrument. This caused some anxiety and lack of focus issues during the performance. As soon as the final manipulation in Variation II occurred, I relaxed and had fun with the final variation. While interest ratings did increase throughout this final section throughout both listening mediums, it is possible this occurred due to the form of the piece, rather than my personal enjoyment of the last variation. Future studies should account for this distraction of the performer, possibly by giving more abstract performance instructions, such as figurative language instruction or asking the performer to "paint a picture to the audience". Additionally, a similar study could be done by asking the performer to play the piece as he/she chooses, then retroactively report the manipulations the performer chose or naturally performed.

Logistics did prove to be an issue in this study, regarding the social contexts of the two listening conditions. The live listening setting occurred on a Monday evening in a recital hall, within the context of a Music Education Recital. While participants were grouped in the balcony, separated from concert goers, it is possible that some audience members attended the recital for the purpose of watching a friend perform, or to engage with multiple musicians. However, the recorded setting occurred in a large rehearsal room on a Friday afternoon, where participants attended for the sole purpose of engaging with the study.

Additionally, only one solo instrument (euphonium) was performed during the study; it is quite possible that incorporating differing musicians into the study, particularly those for whom musicians have preconceived notions (i.e. violinists typically incorporate physical gestures during performances) has the potential to effect results of reported interest levels, as listeners expect to be entertained through visual and musical cues. Another potential limitation of the study is that some participants reported the PAD's as being "*slightly distracting*" during the listening process of the performance; future research may be able to prevent this distraction by using a different means to study audience interest.

Finally, it is important to note the style of *Believe Me, If All Those Endearing Young Charms* is in the Romantic Period, and has a very different live musical tradition than a listener would experience in a jazz, rock, country, or hip-hop concert.

Future Research

As the changes in musical devices did not produce higher rates of interest throughout either of the listening groups, it is important for future research to explore what self-reported interest would be without musical manipulations, meaning the control section was essentially

mimicked (i.e., maintain similar dynamics/tempo/motion). It is possible that while this study did not show higher interest ratings during musical device manipulation, performing the entire selection without any change in musical devices would produce much lower interest ratings.

As one this study drew from a limited pool of participants, future studies should certainly expand as large as possible, encompassing various levels of self-reported musicianship, including those identifying as non-musicians. Another interesting area of research that should be conducted concerns the process of recording live, versus edited audition tapes.

Informal questions were asked of the participants following the recital, regarding the effectiveness of the PAD. Anecdotally, most participants did not find the PAD effected their focus levels, particularly noting the helpfulness of the first "practice piece". Future research should include an exit item or interview to verify with participants the effectiveness of the continuous response dial, particularly asking if the manipulation of the dial had an effect (negative or positive) on their levels of focus.

Finally, future research should take into account the performer's mindset when performing and preparing the piece. Specifically comparing performances where the focus is on technical manipulations, versus a performance focused on visualization/telling a story.

Applications

In a world where many jobs are being automated and concerts are constantly being live-streamed from the comfort of home (by individuals who are otherwise able to attend the live performance), studies into the impact of live music on audience members are of upmost importance to the future of music's place in society. With the aforementioned future research in mind, these findings may inform pedagogy of musicianship, as well as the editing and recordings processes for audition recordings at the amateur and professional levels. Additionally, if this

study were to be repeated with different pieces/forms of music to inform literature selection, it is quite possible that this future research could allow performers to cater to target audience's desires.

Conclusion

While the findings of this study (live music in this particular setting resulted in higher interest rates than the recorded medium) may be intuitive to many musicians and music enthusiasts, it is imperative that this field of research be transparent and widely shared with lawmakers and members of our society to ensure not only funding, but an emphasis that music has an important place within our culture.

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